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Tracking ethanol profitability

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Tracking ethanol profitability

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The profitability of ethanol production is extremely variable. Due to the volatile price nature of ethanol and corn, its major feedstock, ethanol profitability can change rapidly from month to month. In addition, price variations of its co-product (distillers grains with solubles, DDGS) and its energy source (natural gas) add to the variability of ethanol profits.

To track the profitability of corn ethanol production, an economic model of a typical northern Iowa¹ corn ethanol plant was created. This is a 100 million gallon facility with construction costs similar to plants built in 2007. The costs and efficiencies are believed to be typical of northern Iowa ethanol plants.

Major assumptions and characteristics of the ethanol plant model

- 1) Turnkey ethanol production facility
- 2) Facility built in 2007
- 3) Nameplate capacity of 100 million gallons
- 4) Facility construction cost (including working capital)

- of \$1.97 per gallon of ethanol nameplate capacity
- 5) Lender finances 50 percent of the project
- 6) Equity financing of 50 percent of the project.
- 7) Plant operates at 120 percent of nameplate capacity
- 8) Conversion factor of 2.8 gallons of ethanol per bushel of corn
- 9) A bushel of corn produces 18 pounds of distillers grains
- 10) Carbon dioxide is vented (no local market)
- 11) Natural gas requirement of 34 cubic feet per gallon of ethanol
- 12) Typical input costs for an Iowa corn ethanol facility

Input coefficient adjustment. Although we believe the coefficients in this model are a good representation of a corn ethanol plant, the user has the ability to change any of the input coefficients in the model to fit a special situation. A change in an input coefficient will be reflected in the analysis tables and graphs.

The monthly profitability of this hypothetical plant is computed by using the monthly market prices for

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Handbook updates

For those of you subscribing to the handbook, the following updates are included.

Estimated Costs of Crop Production in Iowa - 2008 – A1-20 (12 pages)

Estimating a Value for Corn Stover – A1-70 (4 pages)

Fieldwork Days in Iowa – A3-25 (2 pages)

Suggested Closing Inventory Prices – C1-40 (2 pages)

2007 Farmland Value Survey – C2-70 (5 pages)

Please add these files to your handbook and remove the out-of-date material.

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Inside . . .

Average value of Iowa farmland tops \$3,900 an acre in 2007 survey Page 3

Value-added business success factors -- the role of financial structure and performance Page 5

What's new with crop insurance in 2008..... Page 6

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ethanol, corn, DDGS and natural gas. Each month the analysis is updated with the previous month's prices. All other variables are held constant throughout the analysis.

Monthly price variables

- 1) **Ethanol Price**² – Ethanol daily price F.O.B. (Free on Board) the plant (converted into monthly average prices) at selected ethanol plants in northern Iowa as reported by USDA Ag Market News in the Iowa Ethanol Plant Report (http://www.ams.usda.gov/mn-reports/NW_GR111.TXT).
- 2) **Corn Price** (No. 2 yellow)² – Spot bid daily corn price (converted into monthly average prices) at selected ethanol plants in northern Iowa (north of Interstate 80) as reported by USDA Ag Market News in the Iowa Ethanol Plant Report (http://www.ams.usda.gov/mnreports/NW_GR111.TXT).
- 3) **DDGS Price**² – DDGS daily price F.O.B. the plant (converted into monthly average prices) at selected ethanol plants in northern Iowa as reported by USDA Ag Market News in the Iowa Ethanol Plant Report (http://www.ams.usda.gov/mnreports/NW_GR111.TXT).
- 4) **Natural Gas Price** – Monthly Iowa natural gas price for industrial users as reported by the Energy Information Administration (official energy statistics of the U.S. government) (<http://tonto.eia.doe.gov/dnav/ng/hist/n3035ia3m.htm>).

Price adjustment. Although these prices are representative of northern Iowa ethanol plants, they may not be representative of plants in other regions or states. In the economic model the user can increase or decrease any of the price series by a fixed amount to represent a special situation. An adjustment in a price series will be reflected in the analysis tables and graphs.

To show how this facility would have performed in the past, the monthly profitability time-series is started in January, 2005. Although this facility would not have been in production at this time (built in 2007), it provides a perspective on how this facility would have performed historically.

Revenue, costs and net returns (profitability) are shown monthly per gallon of ethanol and per bushel of corn. Also, ethanol and corn price breakeven levels are computed.

Analysis outputs

Graphs

Monthly Prices

Output prices – ethanol and DDGS
Input prices – corn and natural gas

Monthly Returns

Revenue
Costs
Net returns (profits)
Return on equity

Monthly Breakeven Prices

Net cost per gallon versus ethanol price³
Net revenue per bushel versus corn price⁴

Tables

Monthly revenue, cost, breakeven and profit per gallon
Monthly revenue, cost, breakeven and profit per bushel

Ethanol model

Assumptions (inputs) and Outputs

Many ethanol businesses use risk mitigation strategies such as forward pricing to minimize their financial risk exposure rather than relying on spot market prices. So the financial results of an individual plant may be quite different than the results shown in this analysis. However, spot price analysis provides an indication of the over-all health of the industry.

¹ Northern Iowa is defined as Iowa north of Interstate 80.

² The USDA Ethanol report for Iowa began in October of 2006. Price data prior to Oct 2006 was created for ethanol, corn, and dried distillers grains. The Omaha rack ethanol price, the USDA Interior Iowa Grain (corn) prices, and the Lawrenceburg, Indiana distillers grains price from the USDA Feed Grains Database were used to create this series. The pre-Oct. 2006 series was created by comparing the post-Oct. 2006 Iowa Ethanol price series to these databases prices and adjusting the pre-Oct. 2006 Iowa Ethanol series by these differences.

³ Net cost per gallon includes all costs and subtracts the value of the distillers grains, so it represents the ethanol price needed to break even.

⁴ Net revenue per bushel includes all revenue (DDGS & ethanol) and subtracts all costs except corn, so it represents the corn price needed to break even.